

FENGER (C.)

The Operative Treatment of Extra-Uterine Pregnancy at or Near Term, with Report of a Case.

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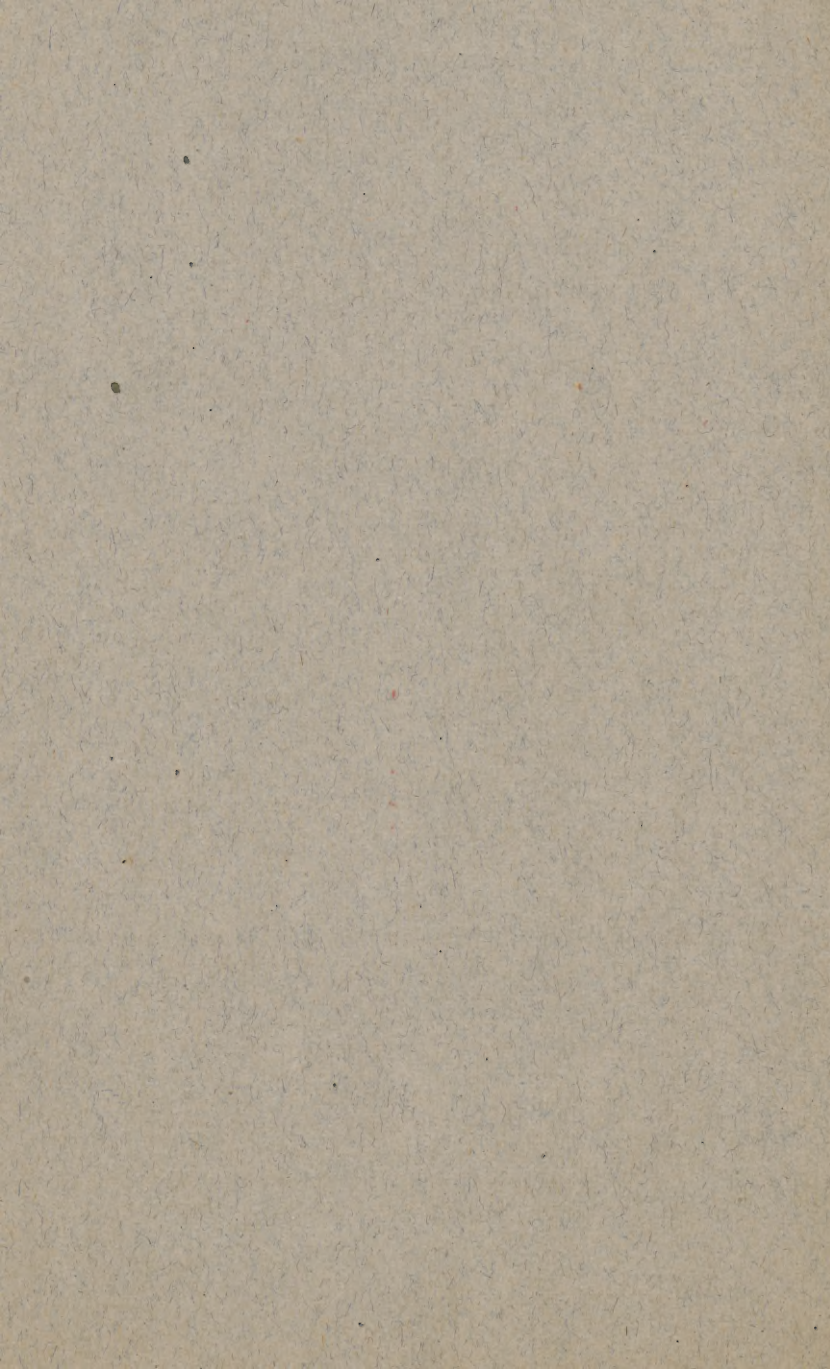
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THE OPERATIVE TREATMENT OF
EXTRA-UTERINE PREGNANCY
AT OR NEAR TERM, WITH
REPORT OF A CASE.

It is not my intention in this paper to give an exhaustive exposé of all the details and the questions that arise in late extra-uterine pregnancy, but merely in connection with a case of this kind, which terminated fatally, to describe the thoughts and reflections that presented themselves to me in connection with the case.

I shall, then, first describe the case, the different methods of operation and their prognoses, and later, review the more important points in the management of such cases from my own experience and from the literature as far as I have been able to obtain it.

Case.—Mrs. C., 34 years of age, married thirteen years. Healthy as a child; first menstruated at the age of 14; always regular; three days' duration; for the past ten years two days only; never very abundant. A slight leucorrhœa for a few days following menstruation. Married at 21; a year later, after a normal pregnancy, was delivered of a female child who lived only ten days. Labor was difficult, but forceps were not used. Slight laceration of perineum. She was in labor from midnight until half-past ten the next morning. She had puerperal fever and

pelvic cellulitis which confined her to bed for three months. She had a slow convalescence, not being well until three months later. Menstruation returned five months after the birth of the child, and since that time, about ten years ago, has been always regular. She has occasionally had slight leucorrhœa, but otherwise has had no symptoms of disease of the genital organs excepting sterility.

March 20, 1890, she had her last normal menstruation. Two or three weeks later, in April, she felt sick, wanted to eat, but after eating would often feel nauseated. May 15, at noon she suddenly felt a severe pain through the anterior part of the abdomen and the rectum, followed by vomiting. These symptoms lasted for ten days, during which time she was obliged to stay in bed. No fever, no symptoms of hæmorrhage. The symptoms then disappeared and after three weeks she resumed her work of teaching school. She was well until July when a sudden attack of pain which came on at night while she was in bed, necessitated her keeping quiet for a few days. After this time pain would often come on during the night, extending from the abdomen down to the knee, more severe in the right leg. August 5, she had a sudden, severe attack of pain and vomiting which kept her in bed for two weeks and necessitated her stay at home for two weeks longer. During this time her temperature was normal.

Between the fifth and tenth of August, while in bed with this apparent attack of peritonitis, she first felt foetal movements, faint at first, later stronger. These continued to be felt until December 29. Uterine hæmorrhage with passage of a decidua membrane was never observed. During September, October and November, she

was able to be up and about attending to her work in school, but almost every evening she would have pain in the abdomen, which would be aggravated on change of position, and would prevent her from sleeping in the early part of the night. In the second week of December the abdominal pain increased and also came on during the day, so that for fear the pain would come on, she did not dare go out of the house.

December 31, spurious labor set in with severe pain in the left side of the abdomen increasing toward night, which lasted for two days. At this time foetal movements ceased. She remained in bed three weeks, during which time the abdomen commenced to decrease in size. February 10, 1891, six weeks after the death of the child, there was a sudden recurrence of the abdominal pain with vomiting and rise of pulse and temperature.

February 11, I made an examination. The patient was in bed, somewhat pale, pulse 100, temperature 100.° She had been suffering from pain and vomiting for two days, but at this time the vomiting had ceased. The mammary glands were large, areolæ, pigmented and abundance of milk coming from the nipples on pressure. The abdomen was enlarged to about the size of pregnancy at term, but more prominent on the left side, with an area of dull percussion up to the body of the ninth rib, while on the right side it did not extend to within two inches of the lower border of the ribs. Tympanitic percussion in the epigastric and both lumbar regions; dull percussion over the umbilical, hypogastric and inguinal regions.

Through the abdominal wall could be felt a harder, round portion of the tumor to the right of and above the umbilicus—the foetal head.

Over the remainder of the tumor no distinct foetal parts could be felt. In the territory below a line extending from the border of the right ribs downward and inward, to midway between the umbilicus and symphysis pubis, and from here to the outer third of the left Poupart's ligament, a distinct placental souffle could be heard, most pronounced in the right hypogastrium.

On vaginal examination, the vaginal portion of the uterus was shown to be somewhat flaccid, standing high up and directed forward against the symphysis pubis. The posterior lacuna was pushed downward into the vagina by a doughy, immovable tumor, probably the placenta, as no foetal parts could be felt. The patient complained of frequent micturation, that she was obliged to pass water every hour except when asleep. The urine was normal in quantity and color and contained neither pus, sugar nor albumin.

I resolved to wait for the cessation of the placental circulation, as might be indicated by the placental souffle, keeping the patient in bed and under symptomatic treatment.

February 10. Area of placental souffle diminished about one-half.

February 22. No placental souffle could be heard. The patient was removed to the Emergency Hospital for operation, which was fixed for a week after her arrival there.

February 25. Diarrhœa set in with slightly bloody stools, the passages soon becoming chocolate-colored. On microscopic examination no pus cells were found, but fecal matter, fine granular matter and blood corpuscles. Pulse and temperature increasing.

February 28. Pulse 110; temperature 103°. She had several passages of a dark, reddish-

brown color. Concluding from this that perforation of the sac into the bowel had taken place, and consequently that sepsis had commenced to appear in the sac, operation at once became necessary.

March 1. Operation. In the presence of the doctors from the Policlinic, Dr. Bellinger, of Council Bluffs, Iowa; assisted by Drs. Bernauer, Hall and Brohm. Chloroform given by Dr. Rosa Engert. Percussion at this time over the entire tumor was tympanitic where it had formerly been dull, showing the presence of air in the foetal sac from perforation of the intestines.

An incision was made in the linea alba, seven inches long, from a point midway between the symphysis pubis and umbilicus, to three inches above the umbilicus. The parietal peritoneum was loosely adherent to the wall of the sac downward; above was the free peritoneal cavity. The sac was here covered with omentum containing a large number of dilated vessels, some of the veins two or three lines in diameter, while most of the adipose tissue of the omentum had disappeared. The parietal peritoneum was united by sutures to the skin. As the adhesions between the parietal peritoneum and the omentum were incomplete, I separated the remaining adhesions with the hand, and packed large sponges into the peritoneal cavity all around the incision, or rather around the territory where the opening of the sac was to be made.

On account of the numerous and large vessels, double ligature of which would have taken too long, I opened the sac with a Paquelin cautery knife. This was used only at red heat. There was considerable hæmorrhage from the omentum, necessitating numerous ligatures. On opening into the sac there was an escape of fetid air, and

later on a discharge of a thin, grayish, fetid fluid of fecal odor. During this time the patient was turned on the side and the wound flushed with warm sterilized water.

The incision was now prolonged six inches. The child presented with the back and left shoulder in the wound. The left arm was first drawn out, but as it was found impossible to deliver the head, the arm was replaced and the left leg drawn out, then the right leg, and thus the child was delivered. After incising the tympanitic abdomen, which collapsed after the escape of the gases, extraction was now easy without violence to the wall of the sac. The umbilical cord was tied two inches from the placenta, at the lower border of the wound. The foetal cavity contained fetid, chocolate-colored fluid and smegma. The patient was now turned on the side and warm sterilized water poured in from a pitcher to flush the cavity until it became reasonably clean, the water being mopped off with large sponges. The large placenta entirely filled the small pelvis and the right iliac fossa up over the surface of the transverse colon. The uterus could not be seen, as it was covered by placenta. The cord was attached down near the symphysis pubis, was of a whitish-gray color and macerated on the surface, showing no signs of circulation. The foetal surface of the placenta was smooth and bluish-gray, looking as if the circulation had ceased.

An attempt to cleanse the inside of the sac by means of soft sponges on long artery forceps, the borders of the sac being held apart by the hand, was immediately followed by a sudden gush of bright red arterial blood from the borders of the placenta, which necessitated immediate packing of the cavity with large pieces of gauze. The

deepest part of the sac was in the left iliac fossa where, to the left of the placenta, the distinct contour of loops of large intestine, probably the descending colon and sigmoid flexure, were distinctly seen. They were felt to be covered with a layer of tissue so thin as to indicate that no sac wall existed. No perforation into the bowel could be seen at any point and no escape of gases from the bowel into the sac was noticed, but the contents of the sac had a distinctly fecal odor. A thorough search for the opening into the intestine was not made, as even the slightest manipulation caused copious hæmorrhage from the borders of the placenta.

The large sponges were now removed from the peritoneal cavity, which was then cleansed by means of smaller sponges on long forceps, and the borders of the sac united to the skin by sutures. Strips of iodoform gauze, for capillary drainage, were introduced between the sutures at six different places to a depth of about two inches between the sac and the abdominal wall. One strip at the right upper border of the wound was introduced four inches, up under the liver. A handful of a mixture of equal parts of salicylic and tannic acids was strewn over the inner wall of the sac and the whole cavity packed loosely with sterilized gauze impregnated with the same powder, of which four ounces in all was used. The wound of incision into the sac was left open and over the packing an antiseptic dressing was applied.

The child was a normally developed male at full term, in a state of commencing maceration. The epidermis was covered with smegma, and in many places was loosened from the corium, which presented a brownish-red, discolored surface.

At the end of the operation, which lasted an

hour and a half, the pulse was 150, and reasonably strong; color natural. Half an hour after the operation, pulse 120. Seven P.M.: temperature 100°; pulse 120; no vomiting; the patient has some pain in the sac and the wound; skin moist, expression natural. She has slept for a short time and does not complain much.

March 2. No vomiting; has slept a little and taken some boiled milk; pulse 120; temperature 101°. The outer dressing, which contained a great amount of thin, grayish fluid of fecal odor, was changed.

March 3. A very little discharge in the dressings. Pulse 110; temperature 101°. She takes liquid nourishment and has a moderate amount of pain, which can be controlled by morphine.

March 5. Two stools of a chocolate-colored fluid containing many small clots of blood. Very little secretion from the dressings.

March 6. Three copious evacuations of a bloody fluid containing several clots as large as a hen's egg.

March 7. Last night and this morning several large coagula and liquid blood passed through the rectum. The patient is pale, extremely anaemic, conjunctiva pale, exsanguinated, pulse 130, weak; temperature 99.5°. The patient is fully conscious, and complains of extreme weakness. Skin of extremities and face cold. Infundation of sixteen ounces of slightly alkaline, saccharated saline solution into the cephalic vein. In the evening pulse 120, stronger, and the extremities warm after the application of hot water bottles.

March 8. During the night there was another hæmorrhage from the bowel, after which the patient became semi-conscious, dozing most of the time and complaining but little. Extremities

and face cold. Pulse 150, weak; temperature 98°. Died at midnight.

March 9. Autopsy, ten hours after death. No blood in the dressings or in the cavity of the sac. The packing of the cavity is almost dry. The cavity of the sac has diminished to one-quarter of the size at time of operation, partly by retraction of the walls, partly by filling in. After removal of the gauze, the placenta was found in place on the posterior wall of the sac.

The autopsy revealed an opening at the upper insertion of the placenta, between the sac and the transverse colon. This opening was so covered by the border of the placenta as to make the blood pass down into the bowels, and not out into the sac. The sac was of very different thickness in its different portions. On the anterior surface it was about one-quarter of an inch thick, corresponding to the surface where the foetus was covered with omentum, and consisted in fact, of the thickened omentum. The remainder of the foetal cavity was entirely surrounded by loops of intestines, small intestine and colon, and here the sac wall was extremely thin, in some places cobweb-like, in other places slightly thicker, and everywhere more or less intimately adherent to the wall of the intestine. These adhesions were the result of a plastic peritonitis commencing at the time of the primary rupture into the peritoneal cavity, and extending as the foetus increased in size.

The placenta extended from the posterior surface of the uterus, entirely filling Douglas' fossa, more than six inches upward to the transverse colon. The placental area of the sac was very thin in some places; so much so that it tore into shreds on even so slight a manipulation as that

required for the removal of the intestines *en masse* during the autopsy.

Summary of History.—We find, in a patient 34 years old, who had had one child, child-bed being followed by pelvic cellulitis, and who was then sterile for eleven years, an extra-uterine pregnancy characterized by the following course:

In the eighth week after last menstruation, probable rupture of a tubal pregnancy, indicated by sudden pain and vomiting; that is, symptoms of peritonitis, lasting for ten days. In the sixteenth week a similar attack, less severe. In the nineteenth week another severe attack of peritonitic symptoms keeping the patient in bed for one month. In the fifth month she felt life. In the second week of the ninth month a moderate attack of peritonitis. At the end of the ninth month spurious labor and death of the child, indicated by cessation of foetal movements. In the fifth week after the death of the child, the placental souffle began to diminish, and two weeks later it had ceased entirely. Six weeks after the death of the child another severe attack attended with peritonitic symptoms. In the eighth week perforation of the sac into transverse colon. At beginning of ninth week, operation; death six days later from hæmorrhage through the bowel.

Remarks.—This case undoubtedly belongs to a class of cases consisting of an original tubal pregnancy which secondarily becomes an abdominal pregnancy with the placenta and foetus located in the abdominal cavity. In the great majority of cases where a tubal pregnancy ruptures at the end of the second or in the third month, the foetus dies and disappears, and if the patient survives the hæmorrhage, both foetus and placenta are removed by absorption. In a small

proportion of cases after this rupture the development of the foetus is continued, and the placenta, still partially connected with the old site in the tube, keeps on growing and implants itself on the walls of the peritoneal cavity, from the small pelvis upward on the anterior, posterior or lateral abdominal wall. When the rupture has given rise to no symptoms of hæmorrhage a plastic peritonitis takes place which quickly forms a barrier between the territory occupied by the foetus and placenta, and the remainder of the peritoneal cavity. The product of this plastic peritonitis is probably first a fibrinous exudate, later on organized into connective tissue which forms the so-called sac. This probably does not differ in any respect from the connective tissue layer found in the wall of any other localized or, as it is called, encapsulated peritoneal exudate.

As the growth of the foetus and placenta continues, more and more space is required, rupture of the sac occurs into a new territory of peritoneal cavity up to this time intact, and this territory is again limited by a plastic peritonitis resulting in an enlargement of the sac sufficient for the needs of its contents for some time. This procedure gives rise to symptoms of peritonitis, acute in its onset, but which gradually subside. In certain forms of purulent peritonitis we find a similar method of intermittent extension giving rise to successive attacks of peritonitis with free intervals between the attacks.

This mode of development makes it natural that the sac should vary in thickness and resistance in different parts. Thus we would expect to find it thicker in the space between two intestinal loops or between a loop of intestine and one of the viscera, than on the convexity of the wall of these organs. The greatest thick-

ness of the sac will be found, as in this case, where the omentum has participated in its formation. This would naturally occur on the anterior surface of the foetal sac. The thinnest portion of the sac wall will be found on the convexity of the loops of intestine, and this is the place where rupture into the intestine takes place, either spontaneously or during attempts at extirpation of the sac.

In extra-uterine pregnancy where a uniformly thick sac wall is found, it is natural to suppose that rupture of the tube has not taken place, but rather a uniform dilatation. These are probably the cases in which one layer of the wall of the sac is composed of organic muscular fibres, and in such cases, total extirpation of the sac is possible.

Entire absence of the sac, the foetus lying in the free peritoneal cavity between intestines which are not matted together with adhesions, is a rare occurrence. Such cases have, however, been described by King, Lawson Tait and Goetsch. In the case of Lawson Tait, the intestines protruded immediately after the extraction of the foetus through an opening made in the posterior cul-de-sac of the vagina. In the case of Goetsch, at the time of laparotomy, a full grown child was found free amongst the intestines, but yet, strange as it may seem, fresh and not decomposed, although laparotomy was not performed until two years and a half after the spurious labor.

Symptoms.—I shall not enter into a consideration of all the symptoms of extra-uterine pregnancy, because these are to be found in the text-books. There are, however, two symptoms in this case to which I wish to call attention, mainly on account of their prognostic significance; first,

the repeated attacks of peritoneal irritation, and second, the final symptom of perforation into the bowels—the bloody diarrhœa.

We notice in this case repeated, severe attacks of symptoms of peritonitis, so severe as to keep the patient in bed sometimes for a month at a time, and characterized by intense abdominal pain, vomiting and occasionally tympanitis. These attacks necessarily caused progressive loss of strength and emaciation, and thus the patient's condition became gradually less and less favorable for operation. In this class of cases early operation, irrespective of the condition of the child or of the placenta, would be likely to give a better prognosis for the mother.

The final catastrophe, perforation of the sac into the intestines, bladder or vagina, is characterized by a discharge of the liquid contents of the foetal sac, liquor amnii or pus; usually mixed with blood. Perforation into the intestinal tract is by far the most common, as the intestinal wall furnishes only slight resistance, and as a large area of the foetal sac must necessarily be formed of loops of intestine. Diarrhœa, usually bloody, is the first symptom, rapidly followed by symptoms of sepsis due to microbic invasion of the sac. Rapid pulse and high temperature commence within twenty-four hours of the rupture. An especially characteristic symptom and one well marked in this case and caused by the entrance of gases from the intestinal tract into the sac, is tympanitic percussion over the area where formerly dull percussion was found. This symptom is of course absolutely pathognomonic of rupture into the bowel.

Rupture into the bowel is a common occurrence, as out of one hundred and thirty-two cases collected by Hecker, cited by Bandl, the foetus

was eliminated through the rectum in twenty-eight instances with recovery of the mother. It is not too much to assume that this condition was present in at least a corresponding proportion of the forty-four cases in which the mother died without an operation having been performed, as sepsis must invariably follow the perforation.

Prognosis.—The prognosis is always grave, varying in the older statistics between a mortality of forty-two and eighty-eight per cent. Heck-er forty-two per cent., Kiwisch eighty-two per cent., Henning eighty-eight per cent.

Operative treatment.—Asepsis in operating has recently given a mighty impulse toward the amelioration of the prognosis of this grave condition, and the successful results as regards saving the lives of the mothers has made the operations for extra-uterine pregnancy to be counted by hundreds during the last four or five years, while formerly they were only sporadic occurrences.

The greatest success is accomplished by the operation in the early months of pregnancy, but it must be acknowledged that operations at or near term are at present not nearly so dangerous as they were in former years. A strict line of distinction must be drawn between the operations in the beginning, and those toward the end of extra-uterine pregnancy. The two conditions, although only different stages of the same anomaly, present such vitally different anatomical conditions, chiefly on account of the difference in the size of the territory and the difficulty of the operation, that comparison is impossible. The early operation is technically no more difficult than the extirpation of the normal non-adherent uterine appendages; the operation toward the end of pregnancy, however, by which we mean the to-

tal removal of ovum and its contents, is always formidable and often technically an absolute impossibility.

Early in pregnancy, whether before or after rupture of the tube, which is almost always the primary seat of extra-uterine pregnancy, the operation presents no technical difficulties. The adhesions are slight or not present, for the tumor rarely exceeds the size of an orange or a large fist. Hæmorrhage is easily controlled by ligation of the vessels of the broad ligament, which can always be found without difficulty. The prognosis of the operation is always good if the mother is in good condition; that is, is not exsanguinated by copious intra-abdominal hæmorrhage from a previous rupture of the tube.

The operation in the latter half or at the end of pregnancy is usually formidable. The extirpation of a sac which often fills the greater part of the abdominal cavity, with adhesions to innumerable loops of intestines, the walls of the sac varying in thickness and consistency from that of tissue paper to a quarter of an inch, together with the danger of hæmorrhage from a full grown placenta which may be divided by the incision into the sac, or if not divided may even by slight detachment at its border cause a gush of blood which would fill the sac in a minute; such conditions put to a most severe test the presence of mind of even the most experienced operator.

In considering the operation in the latter half of extra-uterine pregnancy we distinguish between laparotomy with living child, the so-called primary laparotomy, and laparotomy after the death of the child, the so-called secondary laparotomy. This distinction has no technical, but only a prognostic value for the child and mother.

From another point of view, we distinguish between the radical operation, removal of the whole of the foetal sac with its contents, child and placenta, and the non-radical operation or incision of the sac, a linear opening into the sac large enough for the delivery of the child, and the union of the borders of this incision with the opening in the abdominal wall. As regards this latter operation, we make a further distinction between the operations where the placenta is removed at the operation and those in which it is left to come away spontaneously later on, or as in very rare instances to remain in the peritoneal cavity, where it partially disappears by absorption, or may be transformed into a mass of cicatricial tissue, as has been observed by Goetsch and Braithwaite, on the outer wall of the uterus.

It is evident from what has been already stated that the radical operation is technically the most difficult one, for on account of the nature of the so called sac, its total removal is usually difficult, and very often impossible. Thus the choice between incision and extirpation would require very serious consideration in the individual case, and the surgeon will often find himself in a very serious dilemma in this regard.

Thus in a number of instances, extirpation of the sac has been commenced, but after the operation has been partially performed the extirpation had to be abandoned on account of the impossibility of proceeding further. In such cases a part of the wall has been extirpated and part united with the abdominal wound; in other instances the connection of the sac with the uterus has made it necessary to amputate the latter, in order to accomplish the total removal of the sac. The advantage of the total removal of the sac, even if it involve so serious a complication as ab-

dominal supra-vaginal amputation of the uterus, lies in the control of hæmorrhage by ligation of the uterine arteries, and in the greater security against sepsis or intoxication from a non-removed sac and placenta.

The prognosis of the operation as given by the statistics from the literature up to date shows a remarkable decrease in mortality in the last five years. Primary laparotomy was attended by a very great mortality up to the end of 1886. Thus, Werth reports eight cases with seven deaths, a mortality of eighty-five per cent.; Litzmann, ten cases with nine deaths, ninety per cent.; Harris, thirty cases with twenty-five deaths, eighty-three per cent. From 1887 to 1890 inclusive we find reported by Leopold Meyer seventeen cases with five deaths, a mortality of thirty per cent. This may be fairly considered as the present mortality of primary laparotomy for this condition.

Up to 1886 the mortality of secondary laparotomy was, as Litzmann states, to a great extent dependent upon the presence or absence of placental circulation. The operations before cessation of placental circulation had a high mortality. In ten cases in which the operation was done within the first five weeks after the death of the foetus there were eight deaths, a mortality of eighty per cent.; while later operations, from six weeks to a year after death of the foetus, had a much less mortality; Litzmann reports twenty-three cases with six deaths, a mortality of twenty-six per cent., and Werth, twenty-five cases with eight deaths, a mortality of thirty-two per cent. This great difference in the mortality led Litzmann to advise against operation immediately after the death of the foetus and to advocate delay until after cessation of the placental circulation.

For the last four years, the statistics of secon-

dary laparotomy show a still better prognosis. Leopold Meyer reports seventy-two cases with twelve deaths, a mortality of only eighteen per cent. As far as can be observed, the secondary laparotomies during the last four years have not been performed with strict regard to the cessation of placental circulation. It is likely, however, that Litzmann's advice has caused many operators to postpone the operation as long as possible.

The prognosis of extirpation as compared with incision, so far as the statistics of the last four years enable us to judge of this question, shows very little difference in the mortality of the two operations. Thirty-six cases of extirpation, or the radical operation, have been reported, with six deaths, a mortality of sixteen and seven-tenths per cent.; and sixty-four cases of incision, or the non radical operation, with twelve deaths, a mortality of eighteen and seven-tenths per cent. Four cases were reported in 1890 of partial extirpation; that is, cases in which extirpation was attempted but could not be completed on account of the impossibility of freeing the sac, with two deaths, a mortality of fifty per cent. It will thus be seen from the statistics that incision has been performed nearly twice as often as extirpation.

In the non-radical operation, incision, the question has been raised as to what should be done about the placenta, whether it should be removed or left *in situ*. The attempt to remove it had its justification in the desire to obviate the danger of sepsis or intoxication from the considerable amount of dead tissue of the decomposing placenta. The danger of removing the placenta at the time of operation is on account of the difficulty or impossibility of controlling the hæmorrhage from the site of the placenta. It has been

proposed that those who perform the radical operation should control the hæmorrhage in one of the following three ways:

1. By previous ligation of the spermatic and uterine arteries before removal of the placenta.

2. By ligation *en masse* of the bleeding parts of the placental territory of the sac after the removal of the placenta.

3. By pressure from packing the sac full of sterilized gauze impregnated either with iodoform or with a mixture of salicylic and tannic acids.

Ligation of the spermatic and uterine arteries can be done only in cases where the broad ligaments are accessible. This is probably of comparatively rare occurrence, as in most cases in which the sacs are not well defined, the broad ligaments and uterus are hidden below the placenta.

Ligation *en masse* of the placental territory of the sac is extremely difficult and often impossible, partly because of the enormous hæmorrhage from this territory and partly because of the danger of injury to the intestines if in close proximity to the bleeding placental site.

Pressure by packing the sac with gauze is unreliable, as we have to deal with a cavity which has no firm walls against which to make pressure.

The statistics for the last four years show twelve cases in which the placenta was removed, with four deaths, a mortality of thirty-three per cent.; and twenty-nine cases in which the placenta was left undisturbed, with five deaths, a mortality of seventeen per cent. Thus we may conclude that it is at the present time more safe to leave the placenta intact, as was done in the majority of cases, or at any rate, to limit the at-

tempt to remove the placenta to those specially favorable cases where the afferent vessels can be found and secured before its removal.

Final Remarks.—The most important points to consider in extra-uterine pregnancy advanced beyond four months are:

1. When shall we operate?
2. And what operation shall be done?

The question of the time for operation cannot be solved merely by looking at the mortality from the statistics. The fate of the child I shall leave entirely out of consideration, as I believe that very few operators of to-day agree with Lawson Tait in weighing the life of the child against that of the mother.

The maternal mortality as seen in the statistics, shows as stated above, a great difference between primary and secondary laparotomy, a difference of twelve per cent. in favor of the latter. Notwithstanding this, a number of modern operators are inclined to give up the secondary operation and operate as early as the diagnosis is made irrespective of the child or of the placental circulation.

Certain operators, such as Olshausen, Lawson Tait, Thornton, Werth, Lusk, Wilson, Doran, Hart, Martin, and others, advocate operating as early as possible. To explain this, notwithstanding the apparently greater safety of the late operation, there must be a fallacy in the conclusions drawn from the statistics. This fallacy is the following: A number of patients, especially those having recurrent attacks of peritonitis, will die either from peritonitis or from perforation and sepsis before the time for the late operation has arrived. If these cases of speedy death after rupture were included in the statistics of the mortal-

ity of the secondary operation, its percentage would be materially increased.

During extra-uterine pregnancy the mother is in danger all the time, from rupture with hæmorrhage and sepsis. It is impossible to know when this will occur and it has often been observed, as it was in my case, that rupture has taken place during the time of waiting, before the day set for the operation.

Rupture is always followed by sepsis, and an operation of necessity in the case of a septic patient has of course a bad prognosis. Sometimes even, death will come so suddenly that it would have been impossible to perform an operation, as in an instance mentioned by Harris in which the patient died half an hour after perforation had taken place.

It remains true that a number of extra-uterine pregnancies go through to full term without rupture or even after term for months or years. It also remains true that the longer after the death of the fœtus the operation is performed, the less is the mortality. But it is impossible to foresee in a given case whether or not the patient will escape rupture and sepsis. Hence the conclusion to operate as early as possible as a prophylactic measure. As early as possible means as early as the diagnosis is made, and this I consider to be the standpoint of to-day in this regard.

If the future repeats the history of the past we may confidently expect that the prognosis of the early operation will be still better than heretofore. Future clinical observations should enable us to make a differential diagnosis between two distinct classes of cases: The one, those in which perforating peritonitis does not take place and the patient is in no danger at any period before or after term; the other, those in which the

patient is exposed to the dangers of perforation and sepsis at any time. When this stage of progress has been reached the late operation may again have a legitimate field.

The question of the choice between extirpation and incision is much more difficult. The almost equal mortality from these operations, as shown above in the statistics, helps us very little in this respect, as it does not indicate by any means an equal choice between the two procedures.

The radical operation, desirable as it is, as far as control of sepsis and hæmorrhage is concerned, can be done only in a limited number of cases where the sac is so uniformly strong and the adhesions so favorably arranged as to make this operation possible. In a large number of cases incision would have to be done as a matter of dire necessity, in cases in which the condition of the sac and extensive, short adhesions, especially to the intestines, have made extirpation impossible.

The choice between the two operations is much more difficult after the sac has been opened and the child delivered, for it is often impossible to determine whether an attempted extirpation can be finished or not. The unfinished operation, the so-called partial extirpation, has a mortality of fifty per cent.

A difficult radical operation will tax the skill of the most experienced operator to its utmost, and the attempt to loosen the sac from the intestines has in several instances resulted in multiple intestinal wounds followed by death from shock and hæmorrhage, and this result may follow too bold an attempt in this direction even during the operation. Slight manipulations of the sac have often caused such a formidable and sudden hæmorrhage from the placenta that

further operating has been rendered well nigh impossible.

The future will have to decide whether rapid removal of the placenta, and hæmostasis after its removal, can be advocated as a justifiable and safe procedure.

The non-radical operation has the advantage of being easy of performance, of requiring only a slight amount of operating and of taking but little time. Thus it would seem natural that this operation should be preferred by less experienced operators in all cases.

The placenta should not be removed in the operation of incision excepting in those very late cases where it has been already detached and lies loose in the sac.

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